

**Remedial Action Design/Partial Site  
Remediation Report  
Six Points / Farmers  
Market Redevelopment  
700 Series Properties  
West Allis, Wisconsin**

**May 10, 2012**

**Prepared For  
City of West Allis  
Community Development Authority**

***THE ENVIRONMENTAL MANAGEMENT COMPANY LLC***



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## **SECTION 1            GENERAL INFORMATION**

### **1.1      Client Information**

Community Development Authority (CDA)  
City of West Allis  
City Hall  
7525 West Greenfield Avenue  
West Allis, Wisconsin 53214

Contact:        Mr. John F. Stibal, Director, CDA  
Phone:          414-302-8462

### **1.2      Site Description**

#### Former Site Addresses

6633-6639 West National Avenue  
1609 - 1615 - 1621 - 1623R South 66<sup>th</sup> Street  
66\*\*-6709 West National Avenue  
West Allis, Wisconsin 53214

#### Legal Description

Lots 1 through 11 Block 1, Lots 1 and 2 in Block 2, and Vacated West Lapham Street in Central Improvement Co. Subdivision No. 3 and Lots 5, 6 and part of Lots 7 and 8 in Block 2 of Assessor's Plat No. 269, all in the Southwest 1/4 and Northwest 1/4 of the Northeast 1/4 of Section 3, Township 6 North, Range 21 East, in the City of West Allis, Milwaukee County, Wisconsin

#### General Description

The site is located in the southwest corner of the intersection of West National Avenue and South Six Points Crossing (South 66<sup>th</sup> Street) in the City of West Allis (Figure 1). It is bordered on the north by West National Avenue, on the east by South 66<sup>th</sup> Street, on the south by West Mitchell Street, and on the west by a railroad spur track right-of-way.

A one-story concrete block warehouse building was formerly located adjacent to the central part of the west property line of the site. The building was leased and used for storage of recyclable materials by the business located in the north-western part of the site, National Salvage. The offices, recycling machinery, and additional material storage facilities were located in two(2) small buildings along West National Avenue in the northwestern part of the site.

The two buildings which formerly were located in the northern part of the site were razed in 2003 and the associated 8000-gallon formerly closed-in-place gasoline UST was removed during demolition. These buildings were historically used for manufacture of pre-cast concrete products, and more recently for storage of salvage.

Prior to development of concrete products plant, a service station was historically located along West National Avenue in the north-central part of the site.

The south-central part of the site was occupied by a large industrial building (pre-engineered steel construction above concrete block foundation walls). The building was razed in April 2005. The northern one-half of the building was occupied by Hall Steel, a steel fabrication company, until the end of 2004, when they relocated to a new facility. Most of the southern one-half of the building was occupied by a large warehouse area (Barkow Manufacturing) and a smaller area was occupied by R&B Machining, a steel machining and grinding company. Both companies relocated and removed the equipment stored/operated in the on-site building prior to demolition. The one-story concrete block building attached to the northeastern part of the Hall Steel building was occupied by Door City, a defunct door manufacturing and distribution company. This building was also razed in April 2005.

The outside areas of the site were covered variously by concrete or asphalt, grass or scrub vegetation, or compacted gravel. A fenced area adjacent to the Door City building was used to store an abandoned car and several empty drums and other small containers. A closed truck trailer was present near the center of the site. A moderate amount of debris and trash had accumulated against the exteriors of several of the buildings and perimeter fencing. Several storm sewer drains were present on-site. All pavement, containers, debris, vehicles, and storm sewers were removed during site demolition in April 2005.

### **1.3 Consulting Firm and Contractor Information**

#### Consulting Firm

THE ENVIRONMENTAL MANAGEMENT COMPANY LLC  
2090 Washington Avenue  
Cedarburg, WI 53012

Phone: 262-675-6006  
Contact: Jeffrey L. Hosler  
Email: jlhosler@temco-llc.com

#### Contractors Used For Partial Site Remediation

Azarian LLC  
726 Water Street  
Racine, WI 53403

Service: Building demolition and 8000-gallon UST removal

GTD Inc.  
202 West State Street  
#502  
Rockford IL 61101

Service: Excavation, transportation, off-site disposal of contaminated soil, off-site disposal of contaminated groundwater, small UST closure / removal

Synergy Environmental Lab, LLC  
1990 Prospect Court  
Appleton, WI 54914

Service: Laboratory analysis of soil samples

Contractors Used For Additional Site Investigation

Moraine Environmental, Inc.  
1402 7<sup>th</sup> Avenue  
Grafton, WI 53024-2330

Service: Installation of Soil Borings and Temporary Groundwater Monitoring Wells

Synergy Environmental Lab, LLC  
1990 Prospect Court  
Appleton, WI 54914

Service: Analyses of Soil and Groundwater Samples

## **SECTION 2                      BACKGROUND INFORMATION**

### **2.1      Regional Geologic and Groundwater Conditions**

The regional geology in which the Six Points / Farmers Market Redevelopment Project is located consists of glacial deposits up to 200 feet thick overlying sedimentary bedrock. The glacial deposits are primarily ground moraine and till. These deposits are generally composed of a clay and/or silt matrix with varying amounts of entrained sand and gravel. They are often interbedded with sediment deposited by glacial meltwaters, which locally results in seams and lenses of sand and fine gravel.

Shallow fill and native soils in the vicinity of the project are primarily silty clay. Due to historic local land filling practices and the industrial heritage of the project area, shallow fill is present at most locations in the project area. The fill typically consists of mixtures of clay, silt, and sand, and occasionally includes debris such as brick, concrete and wood. Slag and cinder-like materials, foundry sand, and flyash may be present in some locations. Fill consistency varies from loose to very hard and dense.

### **2.2      Site History and Land Use**

Historical records indicate the central and eastern parts of the site were occupied by residential properties, Cities Fuel & Supply Co., and a ready-mix concrete plant in 1945. By 1950, a concrete products manufacturing facility occupied most of the site. This operation ceased in the late 1970's, and the most recent site building layout and uses described in Section 1.2 were developed in the 1980's.

The northwestern part of the site was occupied by a tavern until 1935 when the property was redeveloped as a scrap and salvage business which operated continuously until demolition preparatory to the current redevelopment.

### **2.3      Contaminant Sources**

The Phase II ESA(s) of the site reported by TEMCO in September 2000 (Property No. 704), September 2002 (Property No. 705) and December 2002 (Property Nos. 701/708/709) and the Site Investigation reported in December 2005 identified several soil and groundwater contaminant sources associated with historic site facilities and uses:

- Leakage from a closed in-place 8,000-gallon gasoline UST near the west side of the building formerly located at 6633 - 6639 West National Avenue. The contaminant plume extended to the south and west toward the railroad spur ROW.
- The historical presence of a service station and fuel storage and supply facility (Cities Fuel & Supply Company) in the northwestern area of the site.
- The former presence of a steel fabrication operation (Hall Steel) and a metal machining operation (R&B Machining) in the large building in the south central part of the site.

### **SECTION 3      ADDITIONAL SITE INVESTIGATION SCOPE OF WORK**

The scopes of work for the three Phase II ESA and follow-on Site Investigation listed above in Section 2.3 were focused primarily on characterization of soil and groundwater contamination caused by former commercial and industrial uses and facilities at the site.

In March 2006, an additional 21 soil borings (SB-25 through SB-45) were drilled and sampled to a depth of ten feet bgs, primarily in the central, southern, and eastern parts of the site. These borings were located on a site grid; soil samples collected from the borings were analyzed for PAH and lead to determine the levels of contamination caused by the inclusion of foundry sand in the historically placed shallow soil fill which covers the bulk of the site.

Additional soil contamination data was obtained from analyses of soil samples collected from borings SB-46 and SB-47 for VOC, PAH, and metals. These borings were drilled and sampled in April 2006 adjacent to the site as part of a Phase II ESA conducted preparatory to the reconstruction of the section of West National Avenue between South 65<sup>th</sup> Street and the rail spur to the west.

Based on an elevated level of lead in a soil sample collected in September 2001 during the Phase II ESA of property No. 704, located in the northeast part of the site, five additional soil borings (SB-48 through SB-52) were drilled and sampled in May 2006. Multiple soil samples from each of these borings were analyzed for lead.

In April 2012, four soil boring/temporary groundwater monitoring wells were drilled and installed to a depth of 15 feet bgs around the perimeter of the contaminated soil excavation which was completed in two phases in 2005/2006 in the northwest part of the site. The soil excavation and removal to off-site biopile treatment is described later in this report, and was the remedial action taken in response to residual petroleum contamination sourced from several of the historical site uses/facilities described in Section 2. Soil samples collected from these borings were analyzed for petroleum VOC to determine residual contaminant levels around the perimeter of the excavation.

Groundwater samples were also analyzed for petroleum VOC to evaluate the need for any further groundwater monitoring at the site. An additional groundwater sample collected from TW-3 was analyzed for PAH. TW-3 is located in the area with the thickest layer of foundry sand containing fill on the site. It is also located near soil boring SB-24; the shallow soil sample collected from SB-24 contained the highest levels of PAH contaminants detected anywhere on the site. The levels of PAH contaminants in the groundwater sample collected from TW-3 should represent the highest levels of PAH groundwater contamination on the site, and were used to evaluate the need for further groundwater monitoring.

## SECTION 4

## COMPREHENSIVE FINDINGS AND CONCLUSIONS OF ALL SITE PHASE II ESA AND SITE INVESTIGATION PHASES

The parts of the following summary of site assessment and investigation findings which describe the northwest area of the site characterize site conditions in this area prior to completion of the two-phase soil excavation/removal/backfilling in 2005/2006.

- The site slopes gently to the south/southwest. The direction of shallow groundwater migration in the area of petroleum hydrocarbon contamination in the northwestern part of the site is generally controlled by the surface topography, i.e. to the west, southwest, and northwest.
- The western part of the site is fill from the ground surface to a depth ranging from 1.5 feet to 7.5 feet bgs. The upper part of the fill consists of various mixtures of crushed stone, gravel, and silty clay, with minor amounts of foundry sand in the western-most areas. The lower part of the fill consists of variable mixtures of silty clay, sand, fine gravel, and foundry sand. The fill is stained dark gray to black with a petroleum odor in most of the northwestern part of the site, particularly in the lower layers of the fill. The surficial fill layer in the central and eastern parts of the site is thinner and contains less or no foundry sand, depending on location. No foundry sand was encountered along the eastern boundary of the site. The fill in this area consists of a thin layer of crushed stone, gravel, and silty clay overlying native silty clay glacial till.
- Native soils lying below the fill consist primarily of silty clay glacial till with minor amounts of clayey gravel, clayey sand, and clayey silt.
- Groundwater was encountered in the soil borings at depths ranging from 2 to 7 feet bgs. The direction of groundwater migration in the western part of the site is to the west, southwest, and northwest.
- Contaminant sources in the northwest part of the site include 1) a former 8,000-gallon gasoline UST located near soil boring SB-3, closed-in-place in 1986 and removed in 2004 along with demolition of the former Salvage Heaven building along West National Avenue, and 2) a former service station reported to have been located in the northern part of the contaminated zone adjacent to West National Avenue, and a fuel supply facility reported to have been located in the northwestern part of the site. The lateral and vertical distribution of petroleum contamination in shallow soils suggests petroleum leakage from former UST systems and gradual development of a groundwater contaminant plume which migrated with shallow groundwater to the west, southwest, and northwest. The available data indicates the contaminant plume is contained on the site.
- The soil petroleum contaminant mass is contained in the depth interval from two feet to 12 feet bgs in the northwestern area of the site. Minor contaminant levels likely

extend below 12 feet bgs, particularly in the source area (northern part of the contaminated zone near soil borings SB-3, SB-4, and SB-6). The majority of the contaminant mass is contained in the depth interval from four feet to eight feet bgs. This is the “smear zone” which is saturated (below the groundwater table) most of the time.

- Petroleum hydrocarbon soil contaminant levels exceed Residual Contaminant Levels (RCL) throughout the source area and the area immediately downgradient to the west, southwest, and northwest, as evidenced by contaminant levels identified in soil samples collected from borings SB-1 through SB-8 and SB-13. Soil contamination is contained on the site, as evidenced by the low levels of PVOC detected in the soil samples collected from borings E-1 and E-3, and the absence of petroleum hydrocarbon detections in soil samples collected from borings located west of E-1 (E-4 and E-5).
- Soil contaminant levels in samples collected from borings SB-1, SB-3, and SB-8 exceed WAC NR746.06(2)(b) Table 1 values. These contaminant levels indicate that petroleum free product is potentially present at these locations. The benzene concentrations in these samples, and in the soil sample from boring SB-5 also exceed the WAC NR 746.06(2)(c) Table 2 value. Concentrations above this value (1.1 mg/kg) indicate the soil is unsafe for direct human contact.

Most of the soil in the northwestern part of the site in the upper 12 feet of the subsurface contains petroleum contamination at levels that require treatment and/or disposal as a solid waste if excavated. Additionally, contaminant concentrations in the source area and immediately downgradient to the southwest indicate the potential presence of free petroleum product, and that the soil is unsafe for direct human contact. Consequently, site redevelopment involving regrading and/or excavation below the upper one to two feet bgs will require soil remediation prior to the start of on-site redevelopment activities.

- Petroleum hydrocarbon groundwater contaminant levels exceed WDNR WAC NR140 enforcement standards throughout the area of petroleum contamination in the northwest part of the site. This area contained the only significant sources of VOC contamination which historically occupied the site. Most of the PVOC contaminated groundwater in this area was removed along with the soil in excavations completed in 2005/2006, including pumping collected groundwater from the excavations for off-site disposal. The very low soil contaminant levels detected in samples collected from borings E-1 and E-3 indicate the groundwater contaminant plume likely terminates within a short distance west of these boring locations.
- Results of analyses of groundwater samples collected in April 2012 from TW-1 through TW-4 show the only residual groundwater contamination is located just south of the former excavation (TW-3), represented by a low level ES exceedance of benzene (10.1 ug/l). PAH analysis of the groundwater sample collected from TW-3, which is located in the area with the highest on-site levels of PAH soil

contamination, show that PAH groundwater contamination is minimal, with only one contaminant, benzo(b)fluoranthene, detected at a level (0.214 ug/l) which slightly exceeds the ES.

- Additional soil VOC contamination was identified in the soil borings completed inside the portion of the large on-site building formerly occupied by Hall Steel and the portion formerly occupied by R&B Machining in the following areas:
  - Adjacent to the floor drain (sanitary sewer system) located near the east end of the former Hall Steel area. A level of tetrachloroethene estimated at 0.041 mg/kg and a napthalene level of 0.031 mg/kg were detected in soil samples collected beneath the concrete floor from 0.5 to four feet bgs.
  - Adjacent to the railroad tracks in the west end of the former Hall Steel area. Very low levels of several Petroleum Volatile Organic Compounds (below RCL's) were detected in samples collected from 2.5 to four feet bgs.
  - In the area formerly occupied by R&B Machining. Very low levels of 2 PVOC (below RCL's), a level of 0.22 mg/kg 1,1,1-TCA, and an estimated level of 0.031 mg/kg TCE were detected in soil samples collected from 1 to 4 feet bgs. Two very low level detections of methylene chloride in these samples have been attributed to laboratory contamination.
- Source(s) of the chlorinated VOC contamination are unknown. Neither Hall Steel Co. nor R&B Machining Co. used chlorinated solvents in their respective operations according to company staff interviewed by TEMCO. In both cases, contamination is likely sourced from historic, occasional use of cleaning products which formerly contained chlorinated VOC.

Soil contaminant levels resulting from former metal fabricating and machining operations conducted in the former large on-site building are very low and confined to near surface soil. The contaminant levels and distribution are consistent with minor surface discharges of hydrocarbons and solvents during the operational life of the former facilities. The soil VOC levels detected would represent low level RCL exceedances for the soil to groundwater pathway using the USEPA Soil Screening Calculator, but do not exceed the Soil Screening DC-NI or Inhalation related RCL.

Soil samples collected from TW-1 through TW-4, installed around the perimeter of the soil excavation area, indicate the only area where residual soil PVOC contamination remains is on the south side of the excavation. A benzene level of 400 ug/kg benzene was detected in the soil sample collected from 6 to 7 feet bgs in TW-3. The PVOC levels detected indicate a relatively small volume of low level PVOC contaminated soil remains adjacent to the south side of the soil excavation.

- PAH contaminants in shallow soil fill are widely distributed throughout the site, except in the area of proposed Building P (southeast corner of the site), and the area of the completed soil excavations (northwest area of the site), which were backfilled with clean, imported fill. PAH contamination is confined to the depth interval 0 to 6 feet bgs. This zone consists primarily of soil fill with varying amounts clay, silt, sand, gravel, and foundry sand. PAH contaminant levels which exceed the DC-NI RCL are widely distributed, with the highest levels occurring in the area just south of the completed soil excavations (area of proposed Building R).
- The only DC-NI RCL exceedances for metals detected on the site are for arsenic and lead. The arsenic RCL exceedances are widespread throughout the shallow soil fill, but are considered within the range of natural regional background, i.e. less than 6 mg/kg. Only two DC-NI RCL exceedances of lead were detected on the site, both of which are located in the area of proposed Building N.

## **SECTION 5 REMEDIAL ACTION PLAN**

### **5.1 Redevelopment Plan For 700 Series Properties ( Property Nos. 701, 702, 703, 704, 705, 709)**

The Six Points Farmers Market Neighborhood Plan incorporates housing, retail, commercial, and parking components. It provides linkages to the downtown area and former Allis-Chalmers commercial area. The plan invigorates the historic Farmers Market and provides additional parking for merchants along Greenfield Avenue.

The high density urban in-fill plan encompasses a broad section of the Six Points area. The redevelopment of the 700 Series Properties portion of the Six Points/Farmers Market area will provide much needed market rate apartment living units to support the development of new and expanding businesses in the West Allis area.

The 700 Properties area includes construction of four new buildings (illustrated on the site plan as N, P, Q/R, and S). The buildings will reinforce the historic appeal of the open air Farmers Market. All four buildings will consist of four stories of apartment units above partially exposed underground parking garages. Building Q/R will be constructed first, and will include 112 apartment units. Buildings N, P, and S will be constructed on a schedule dictated by market demand, and will include 45, 44, and 44 apartment units, respectively. The redevelopment project is currently estimated to be completed within five years. Most of the exterior area of the site will be paved as parking areas to supplement the underground parking garages. The remaining site areas will be paved driveways, walkways, and landscaped areas.

### **5.2 Impact of Site Redevelopment Plan on Feasibility of Remedial Action Options/Evaluation of Contamination Exposure Pathways**

High levels of PVOC in the shallow soil and groundwater in the northwestern part of the site established the need for active site remediation in this area, primarily to mitigate the threat of direct human contact and the potential for migration of harmful vapors into commercial and residential buildings to be constructed in this area during site redevelopment. Available remedial action options for PVOC contamination generally consist of the following:

- performance standard (engineered controls to contain/isolate contaminated media) and institutional controls
- in-situ treatment to accelerate bio-treatment
- excavation with on-site biotreatment/soil management
- excavation with off-site commercial biotreatment

The following features of the site redevelopment plan adversely affect the feasibility of the initial three remedial options:

- The northwestern area of the site must be excavated to provide an underground parking garage for a large, multi-story residential apartment building.
- The redevelopment plan for the remaining areas of the site consists entirely of a dense mixture of residential apartment buildings, all of which will require significant volumes of soil excavation for underground parking garages.
- The high density of the planned site redevelopment provides no available area for on-site soil biotreatment.

Based on the site conditions and site redevelopment plan described above, excavation of contaminated soil with off-site commercial biotreatment was selected as the most cost-effective remedial option for the northwestern area of the site.

As noted in Section 4, soil contamination in the remainder of the site consists primarily of PAH contaminants widely distributed in the upper 4 to 6 feet of shallow soil fill at relatively low concentrations which frequently exceed the DC-NI RCL. DC-NI RCL exceedances of lead were detected in only two soil samples collected in the northeastern area of the site.

Additionally, a few low level detections of VOC contaminants were found in shallow soil samples collected in the Building R area and in the area near the southwest corner of Building P. The only DC-NI RCL exceedance for VOC was the low level detection of benzene adjacent to the south side of the former petroleum contaminated soil excavation. An estimated small volume of residual soil contaminated with low levels of VOC is located in this area.

Building R will be constructed directly over this area, although the depth of the building excavation will be a maximum of 2.6 feet bgs in this area, and the zone of contamination from which the soil sample was collected was 6 to 7 feet bgs. Potential exposure concerns are mitigated by the fact that the soil benzene level detected is well below the inhalation soil screening levels calculated by the USEPA Soil Screening Calculator, and the building design, which includes active ventilation in the underground parking garages of all on-site buildings.

### **5.3 Site Remediation Completed In Northwestern Area Of Site**

During demolition of the former concrete products manufacturing buildings in the north central part of the site in June 2004, the 8,000-gallon gasoline UST closed-in-place in 1986 was removed and disposed off-site. UST closure documentation is included in Appendix A.

The first phase of soil excavation and removal from the site was conducted in April 2005 concurrent with demolition of the Hall Steel / Barkow Manufacturing / R&B Machining / Door City buildings in the south central part of the site. Approximately 10,077 tons of petroleum contaminated soil were excavated from the northwestern area of the site over a one(1) week period in late April 2005. The contaminated soil was transported to the Waste Management Orchard Ridge RDF facility for bio-treatment and disposal. Soil treatment / disposal documentation is included in Appendix B.

Observations made during excavation of petroleum contaminated soil include the following:

- the typical stratigraphic profile observed during soil excavation was as follows:
  - pavement
  - 0.5 to 1.0 feet gravel
  - 4 feet brown, silty clay
  - 4 feet dark gray to black silty clay and sand and gravel mixture
  - 1 foot brown and green silty clay
  - light brown, uncontaminated silty clay (excavation bottom)
- evidence of a historical service station in the northwestern part of the site, including three(3) small empty abandoned UST (1-250 gallon and 2-500 gallon), concrete building foundations and basement floor.
- evidence of a fuel storage / supply facility in the north-central part of the site, including numerous 2 inch diameter steel pipes containing petroleum product, concrete foundations, and large amounts of wood debris.

All on-site drummed soil (investigative waste) was emptied into trucks and transported to the disposal site.

Approximately 3,000 gallons of water collected in the excavation (primarily rainwater) was removed and disposed in the municipal sewer system under an MMSD permit.

The three(3) closed UST's, steel fuel delivery piping, and empty 55-gallon drums, and other metal debris were handled (scrapped) by the demolition contractor (Azarian). The demolition contractor also disposed all excavated concrete and asphalt, and storm sewer catch basin and lateral piping.

A composite sample of soil fill from a construction / demolition project elsewhere in the City of West Allis was collected and analyzed for a full suite of potential contaminants (off-site sample in Tables 1,2,3,4, and 5) prior to placement of the fill in the completed on site excavation. The analytical data indicates the fill contained low levels of several PAH compounds, arsenic, and lead. The quantity of this fill was approximately 300-400 tons. It was placed in the bottom of the south end of the excavation from approximately 8 to 10 feet bgs.

During and following the soil excavation, numerous sidewall and bottom soil samples were collected and analyzed for petroleum related contaminants to characterize the contaminant levels of soil transported to the biopile, and to estimate the quantity and location of residual contamination remaining on-site.

The "LF" soil samples represent soil excavated and transported to the biopile. The

“Excavation Bottom” 1 and 2 samples, as well as “Mid, N. End, NE, and Middle S” samples represent locations on the completed floor of the excavation, both near sidewalls and from the interior of the excavation.

The data indicate that nearly all the petroleum contaminated soil was removed from the site. Low levels of PVOC residual soil contamination remain in the north central part of the site adjacent to the West National Avenue (Excavation Bottom 1).

In April and May 2006, the remaining warehouse in the west central part of the site, and the two(2) small buildings in the northwest part of the site along West National Avenue, were demolished. Following demolition, the second phase of the soil excavation was completed. The excavation extended west from the west wall of the original excavation and was completed to remove the farthest downgradient residual petroleum soil contamination.

Approximately 1,454 tons of soil were excavated and transported to Waste Management Orchard Ridge RDF for treatment / disposal under the original waste profile and disposal contract. During and following the soil excavation, soil samples were collected primarily from the sidewalls at approximately 8 feet bgs. The results of soil sample analyses indicate low levels of only a few PVOC, primarily benzene, remain in residual soil along the northern boundary of the excavation (EX-1 and EX-3) adjacent to West National Avenue and near the southern boundary of the excavation (EX-8). The excavation was completed to between 10 to 11 feet bgs to intercept the light brown, silty clay and ensure that virtually all petroleum soil contamination was removed. Weather conditions during and following completion of the excavation were dry; no precipitation or groundwater accumulated in the excavation.

The schedule of the Six Points / Farmers Market Redevelopment Project in May 2005 showed redevelopment of the site commencing in 2009-2010. To protect public safety and to prevent the excavation(s) from filling with precipitation, which would require frequent removal and disposal of accumulated water, the City of West Allis filled the excavations with fill generated by several road and site reconstruction projects underway in the City.

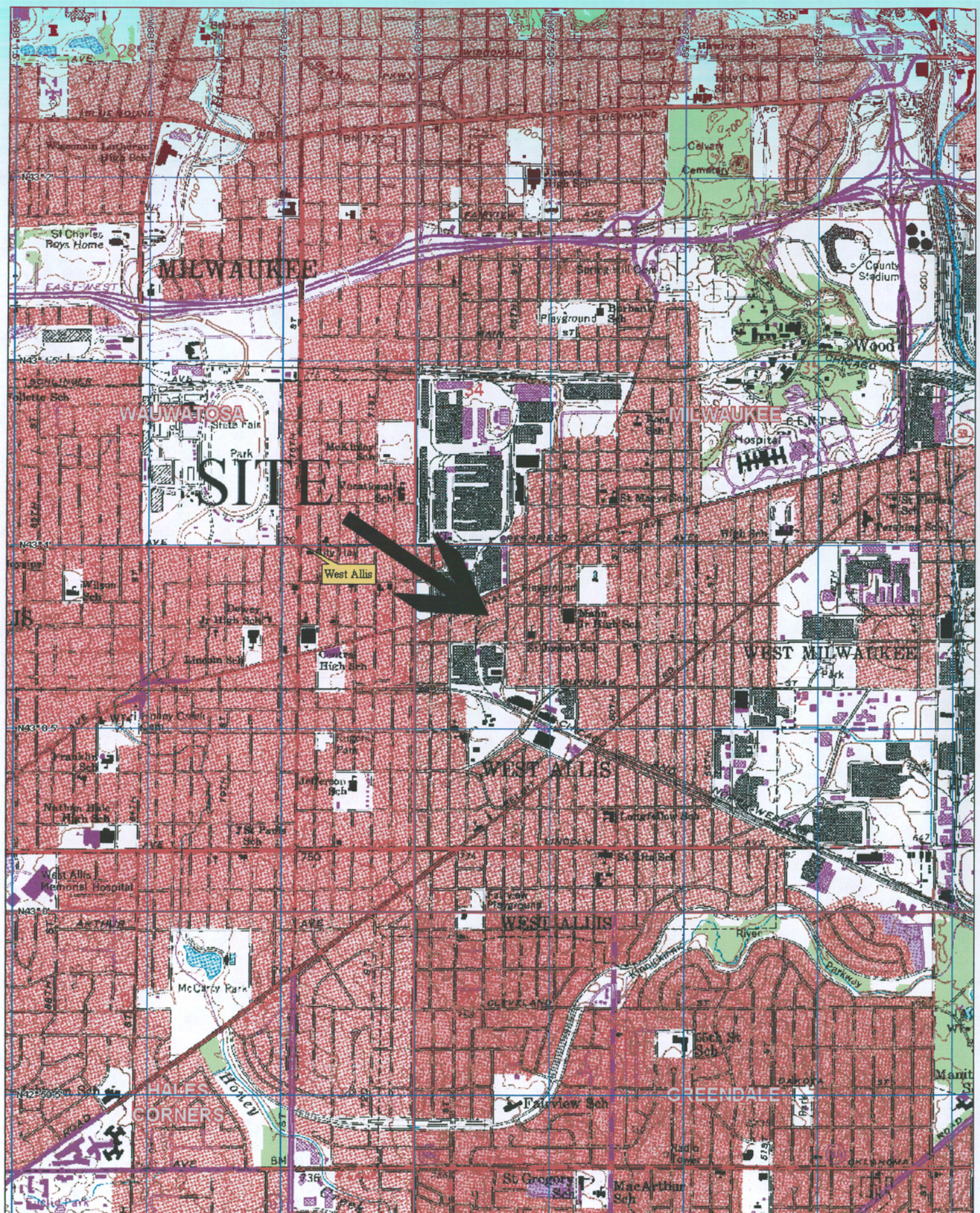
#### **5.4 Remedial Action Plan For Remainder Of Site**

The remedial action plan for the remaining areas of the site is integrated with the site redevelopment plan. During the first construction season, currently planned for 2012, the following construction activities will be completed:

- All four building foundation excavations will be completed. Since the current site plan calls for relatively shallow foundation excavations, all of the excavated soil, except soil from the Building P area, will be considered contaminated, primarily with PAH contaminants above their respective DC-NI RCL. Several small areas contain low level VOC or lead contaminated soil as described in Section 4. The soil to be excavated for the Building P foundation is uncontaminated and its use will be unrestricted.

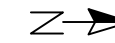
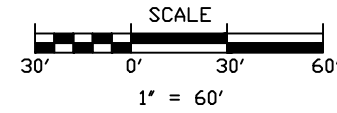
- The soil excavated for the Building Q/R, N, and S foundations will be spread and compacted in the site areas to be paved, primarily large surface parking lot areas (see site plan). Pavement over all areas filled with contaminated soil will be constructed following placement and compaction of fill to planned grade elevation.
- Due to the relatively deep excavation cuts which must be made in the northeast corner of the Building N area (see soil excavation plan), adjacent to West National Avenue, South 66<sup>th</sup> Street, and the associated public utility corridors, soil backfill must be placed in the foundation excavation to stabilize the slopes adjacent to the roadways. The construction plan calls for using clean soil backfill excavated from the north end of the Building R foundation excavation. This backfill is imported soil used to backfill the excavation of petroleum contaminated soil completed in 2005/2006. This soil will be re-excavated from the Building N foundation excavation for unrestricted use when construction of Building N is initiated in the future.
- All public and commercial utility lines and facilities will be constructed throughout the site, except for connections to future buildings. Soil excavated from utility trenches will be treated as contaminated and replaced in areas to be paved. A small area of the site planned for pavement will be left open to allow placement of contaminated soil excavated from any utility trenches which must be excavated in future years of site development.
- The soil exposed in the sidewalls and at the bottom of the foundation excavations for Buildings N and S will be a mixture of contaminated and uncontaminated soil. The exposed soil in the Building P excavation will be uncontaminated. To prevent direct contact with and erosion of contaminated soil, topsoil and grass seed will be applied to the sidewalls and bottoms of the Building N, P, and S foundation excavations such that a stand of grass develops prior to the end of the growing season. The excavation floors will be sloped to drain, and storm water will be routed to an on-site catch basin installed as part of the site stormwater management system.
- Landscape areas which contain either residual or replaced contaminated soil will be covered with a clean soil cap with a minimum finished thickness of one foot.
- The site Health and Safety Plan prepared and used by on-site contractors should specify that direct contact with all soil fill excavated and replaced on-site should be minimized, except for soil excavated from the Building P area and the north end of Building R. No special personnel protective equipment or procedures beyond OSHA required safety procedures are needed.
- Periodic site inspections during the construction season will be conducted by qualified personnel to assure that the requirements of this remedial action plan are met. Site inspection reports describing any issues and resolution will be prepared and distributed to the City of West Allis, the site developer, and appropriate project contractors.

# FIGURES



LEGEND

----- PROPERTY LINES



THE ENVIRONMENTAL MANAGEMENT COMPANY LLC	
DATE: 04/28/12	DRAWN BY: TJM
LOCATION: 6633-39 W. NATIONAL AVE WEST ALLIS, WISCONSIN	

FIGURE 2  
SOIL BORING, MONITORING WELL,  
AND TEMPORARY WELL LOCATIONS

W. MITCHELL STREET

SPUR TRACK

SB-11

SB-10

SB-12

SB-19

SB-20

SB-24

SB-9

SB-21

BLDG. R

SB-7

TW-3

TW-4

MW-8

MW-7

SB-6

SB-5

MW-1

SB-1

SB-2

MW-2

MW-6

SB-3

TW-2

TW-1

BLDG. S

SB-18

SB-40

SB-41

SB-42

SB-39

SB-38

SB-37

SB-33

SB-34

BLDG. Q

SB-30

SB-29

SB-31

SB-14

SB-13

SB-8

SB-15

MW-4

MW-3

SB-4

SB-26

SB-25

SB-28

SB-27

SB-35

SB-22

SB-36

SB-23

SB-16

SB-17

BLDG. P

BLDG. N

SB-45

SB-50

SB-44

SB-49

SB-51

SB-43

SB-48

SB-52

SB-46

78' EAST

SB-47

COMPLETED SOIL EXCAVATION/  
SOIL REMOVED TO  
OFF-SITE BIOTREATMENT

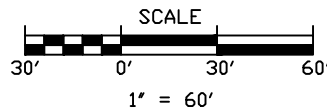
SOUTH 66TH STREET

W. NATIONAL AVE

ELECTRIC  
6" GAS MAIN  
GAS & WATER

LEGEND

PROPERTY LINES



THE ENVIRONMENTAL MANAGEMENT COMPANY LLC

DATE: 04/28/12 DRAWN BY: TJM

LOCATION: 6633-39 W. NATIONAL AVE  
WEST ALLIS, WISCONSIN

FIGURE 3.1  
SOIL CONTAMINANT DISTRIBUTION  
VOC & DRD

CONTAMINANT		RCL
BEN	BENZENE	0.0055
ETH	ETHYLBENZENE	2.9
NAP	NAPHTHALENE	0.4
TOL	TOLUENE	1.5
XYL	XYLENES (TOTAL)	4.1
DRD	DIESEL RANGE ORGANICS	250

ALL CONTAMINANTS REPORTED  
IN MILLIGRAMS PER KILOGRAM

ONLY CONTAMINANT LEVELS ABOVE  
RESIDUAL CONTAMINANT LEVELS SHOWN

CONTAM DETECT DEPTH		DATE
BEN	0.28	8-12 6/19/02
NAP	1	8-12 6/19/02

CONTAM DETECT DEPTH		DATE
DRD	540	0-4 6/19/02

CONTAM DETECT DEPTH		DATE
BEN	0.4	6-7 4/5/12

CONTAM DETECT DEPTH		DATE
BEN	0.18	4-8 6/19/02

CONTAM DETECT DEPTH		DATE
BEN	5.7	4-8 6/19/02
ETH	44	4-8 6/19/02
NAP	27	4-8 6/19/02
TOL	32	4-8 6/19/02
XYL	148	4-8 6/19/02
DRD	350	4-8 6/19/02

CONTAM DETECT DEPTH		DATE
BEN	13	8-12 6/19/02
ETH	41	8-12 6/19/02
NAP	19	8-12 6/19/02
TOL	75	8-12 6/19/02
XYL	164	8-12 6/19/02

CONTAM DETECT DEPTH		DATE
BEN	0.03	4-8 6/19/02

CONTAM DETECT DEPTH		DATE
BEN	1.2	4-8 6/19/02
ETH	2.9	4-8 6/19/02
NAP	1.7	4-8 6/19/02
XYL	10.3	4-8 6/19/02

CONTAM DETECT DEPTH		DATE
BEN	6.1	4-8 6/19/02
ETH	22	4-8 6/19/02
NAP	20	4-8 6/19/02
XYL	52.8	4-8 6/19/02

CONTAM DETECT DEPTH		DATE
BEN	1	8-12 6/19/02
NAP	2.3	8-12 6/19/02
XYL	5	8-12 6/19/02

COMPLETED SOIL EXCAVATION/  
SOIL REMOVED TO  
OFF-SITE BIOTREATMENT

W. MITCHELL STREET

SOUTH 66TH STREET

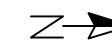
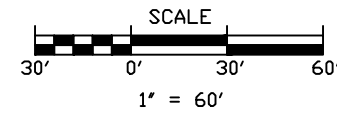
78' EAST

SB-47

# LEGEND

PROPERTY LINES

SPUR TRACK



THE ENVIRONMENTAL MANAGEMENT COMPANY LLC	
DATE: 04/28/12	DRAWN BY: TJM
LOCATION: 6633-39 W. NATIONAL AVE WEST ALLIS, WISCONSIN	

FIGURE 3.2  
SOIL CONTAMINANT DISTRIBUTION  
PAH

COMPLETED SOIL EXCAVATION/  
SOIL REMOVED TO  
OFF-SITE BIOTREATMENT

PAH CONTAMINANT- NI-DC RCL		
B(a)A	BENZ (a) ANTHRACENE	0.008
B(a)P	BENZ (a) PYRENE	0.0088
B(b)F	BENZ (b) FLUORANTHENE	0.008
B(b)F	BENZ (b) FLUORANTHENE	0.88
D(a,h)A	DIBENZ (a,h) ANTHRACENE	0.0088
I(1)P	INDENO (1,2,3-cd) PYRENE	0.008

ALL CONTAMINANTS REPORTED  
IN MILLIGRAMS PER KILOGRAM

ONLY CONTAMINANT LEVELS ABOVE  
RESIDUAL CONTAMINANT LEVELS SHOWN

SB-19			
CONTAM	DETECT DEPTH	DATE	
B(a)A	1-2	6/20/02	
B(a)P	1-2	6/20/02	
B(b)F	1-2	6/20/02	

SB-24			
CONTAM	DETECT DEPTH	DATE	
B(a)A	1.52	0.5-1.5	01/05/05
B(a)P	1.5	0.5-1.5	01/05/05
B(b)F	1.86	0.5-1.5	01/05/05
B(b)F	1.25	0.5-1.5	01/05/05
D(a,h)A	0.194J	0.5-1.5	01/05/05
I(1)P	0.413	0.5-1.5	01/05/05

SB-40			
CONTAM	DETECT DEPTH	DATE	
B(a)A	0.393	2.5-3.5	03/13/06
B(a)P	0.421	2.5-3.5	03/13/06
B(b)F	0.852	2.5-3.5	03/13/06
D(a,h)A	0.061	2.5-3.5	03/13/06
I(1)P	0.213	2.5-3.5	03/13/06

SB-41			
CONTAM	DETECT DEPTH	DATE	
B(a)A	0.195	3-4	03/13/06
B(a)P	0.308	3-4	03/13/06
B(b)F	0.517	3-4	03/13/06
D(a,h)A	0.033J	3-4	03/13/06
I(1)P	0.192	3-4	03/13/06

SB-38			
CONTAM	DETECT DEPTH	DATE	
B(a)A	0.859	1.5-2.5	03/13/06
B(a)P	0.842	1.5-2.5	03/13/06
B(b)F	1.230	1.5-2.5	03/13/06
D(a,h)A	0.088	1.5-2.5	03/13/06
I(1)P	0.383	1.5-2.5	03/13/06

SB-42			
CONTAM	DETECT DEPTH	DATE	
B(a)A	0.083	3-4	03/13/06
B(a)P	0.081	3-4	03/13/06
B(b)F	0.253	3-4	03/13/06
D(a,h)A	0.019J	3-4	03/13/06
I(1)P	0.076	3-4	03/13/06
B(a)P	0.011J	5.5-6.5	03/13/06

SB-37			
CONTAM	DETECT DEPTH	DATE	
B(a)A	0.105	2-3	03/13/06
B(a)P	0.081	2-3	03/13/06
B(b)F	0.181	2-3	03/13/06
D(a,h)A	0.030J	2-3	03/13/06

SB-33			
CONTAM	DETECT DEPTH	DATE	
B(a)A	0.395	4-5	03/13/06
B(a)P	0.446	4-5	03/13/06
B(b)F	1.070	4-5	03/13/06
D(a,h)A	0.104	4-5	03/13/06
I(1)P	0.239	4-5	03/13/06

SB-31			
CONTAM	DETECT DEPTH	DATE	
B(a)A	0.095	4-5	03/13/06
B(a)P	0.071	4-5	03/13/06
B(b)F	0.264	4-5	03/13/06
D(a,h)A	0.021J	4-5	03/13/06

SB-23			
CONTAM	DETECT DEPTH	DATE	
B(a)P	0.064J	0.5-1.5	01/05/05
B(b)F	0.096J	0.5-1.5	01/05/05

SB-25			
CONTAM	DETECT DEPTH	DATE	
B(a)A	0.601	2-3	03/13/06
B(a)P	0.539	2-3	03/13/06
B(b)F	0.913	2-3	03/13/06
D(a,h)A	0.079	2-3	03/13/06
I(1)P	0.258	2-3	03/13/06

SB-45			
CONTAM	DETECT DEPTH	DATE	
B(a)A	0.175	2-3	03/15/06
B(a)P	0.139	2-3	03/15/06
B(b)F	0.418	2-3	03/15/06
D(a,h)A	0.025J	2-3	03/15/06
I(1)P	0.121	2-3	03/15/06

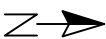
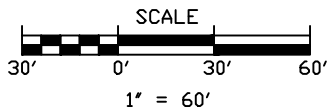
SB-44			
CONTAM	DETECT DEPTH	DATE	
B(a)A	0.466	2-3	03/15/06
B(a)P	0.408	2-3	03/15/06
B(b)F	0.772	2-3	03/15/06
D(a,h)A	0.039	2-3	03/15/06
I(1)P	0.259	2-3	03/15/06

78' EAST

LEGEND

PROPERTY LINES

SPUR TRACK



THE ENVIRONMENTAL MANAGEMENT COMPANY LLC			
DATE:	04/28/12	DRAWN BY:	TJM
LOCATION:	6633-39 W. NATIONAL AVE WEST ALLIS, WISCONSIN		

FIGURE 3.3  
SOIL CONTAMINANT DISTRIBUTION  
METALS

COMPLETED SOIL EXCAVATION/  
SOIL REMOVED TO  
OFF-SITE BIOTREATMENT

W. MITCHELL STREET

W. NATIONAL AVE

SOUTH 66TH STREET

CONTAMINANT		RCL
ARS	ARSENIC	0.039
LEAD	LEAD	50

ALL CONTAMINANTS REPORTED  
IN MILLIGRAMS PER KILOGRAM  
  
ONLY CONTAMINANT LEVELS ABOVE  
RESIDUAL CONTAMINANT LEVELS SHOWN

SB-20			
CONTAM	DETECT	DEPTH	DATE
ARS	1.9	5-6	10/19/04

SB-19 SB-20 SB-24

SB-21

BLDG. R

SB-32

SB-31

SB-33

SB-30

BLDG. Q

SB-34

SB-29

SB-37

SB-37			
CONTAM	DETECT	DEPTH	DATE
ARS	3.1	5.5-6.5	03/13/06

SB-35

SB-28

SB-22

SB-23

SB-27

BLDG. P

SB-36

SB-27

SB-27			
CONTAM	DETECT	DEPTH	DATE
ARS	4.9	5.5-6.5	03/13/06

SB-26			
CONTAM	DETECT	DEPTH	DATE
ARS	1.2	4-5	03/13/06

SB-26

SB-25

SB-50			
CONTAM	DETECT	DEPTH	DATE
LEAD	<5	0-4	05/24/06
ARS	4.7	4-8	05/24/06

SB-50

SB-45

SB-44

SB-49

SB-49			
CONTAM	DETECT	DEPTH	DATE
ARS	3.3	0-4	05/24/06

SB-49

SB-48			
CONTAM	DETECT	DEPTH	DATE
ARS	5.3	4-8	05/24/06
LEAD	80	4-8	05/24/06

SB-48

SB-51			
CONTAM	DETECT	DEPTH	DATE
LEAD	7.0	0-4	05/24/06
LEAD	8.8	4-8	05/24/06

SB-51

SB-46			
CONTAM	DETECT	DEPTH	DATE
ARS	4.7J	2-4	04/04/06

SB-46

SB-51

SB-43

SB-48

SB-50

SB-3

(#704)

SB-3			
CONTAM	DETECT	DEPTH	DATE
LEAD	484	1-2	09/12/01

SB-3

SB-47			
CONTAM	DETECT	DEPTH	DATE
ARS	5.1	1.5-2.5	04/04/06

SB-47

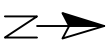
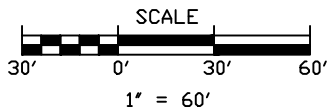
78' EAST

SB-47

LEGEND

PROPERTY LINES

SPUR TRACK



THE ENVIRONMENTAL MANAGEMENT COMPANY LLC		
DATE:	04/29/12	DRAWN BY: TJM
LOCATION:	6633-39 W. NATIONAL AVE WEST ALLIS, WISCONSIN	

FIGURE 4  
GROUNDWATER CONTAMINANT  
DISTRIBUTION

COMPLETED SOIL EXCAVATION/  
SOIL REMOVED TO  
OFF-SITE BIOTREATMENT

VOC CONTAMINANT		ES
BEN	BENZENE	5
EBEN	ETHYL BENZENE	700
TBUT	tert-BUTYL BENZENE	-
NBUT	n-BUTYL BENZENE	-
SBUT	sec-BUTYL BENZENE	-
NBUT	n-BUTYL BENZENE	-
CHLM	CHLOROMETHANE	-
CHLE	CHLOROETHANE	400
PISO	p-ISOPROPYL TOLUENE	-
IIDCA	1,1-DICHLOROETHANE	7
IIDCE	1,1-DICHLOROETHENE	70
C12	cis-1,2-DICHLOROETHENE	70
ISOP	ISOPROPYL BENZENE	-
T12	trans-1,2-DICHLOROETHENE	100
NPRO	n-PROPYL BENZENE	-
TOL	TOLUENE	1000
TCE	TRICHLOROETHENE	5
TMB	TRIMETHYL BENZENES	480
VC	VINYL CHLORIDE	0.2
NAP	NAPHTHALENE	40
XYL	XYLENES	10000

ALL CONTAMINANTS SHOWN IN ug/L  
MICROGRAMS PER LITER

ES ENFORCEMENT STANDARD

ONLY ES EXCEEDANCES SHOWN

MW-9			
CONTAM	DETECT	STANDARD	DATE
BEN	3,600	ES	05/14/03
ETH	1,100	ES	05/14/03
NAP	270	ES	05/14/03
BEN	3,180	ES	06/08/04
ETH	823	ES	06/08/04
NAP	224	ES	06/08/04

MW-5			
CONTAM	DETECT	STANDARD	DATE
BEN	170	ES	05/14/03
BEN	280	ES	06/08/04

MW-8			
CONTAM	DETECT	STANDARD	DATE
BEN	3,000	ES	05/14/03
BEN	370	ES	06/08/04

MW-7			
CONTAM	DETECT	STANDARD	DATE
BEN	620	ES	05/14/03
BEN	340	ES	06/08/04

MW-6			
CONTAM	DETECT	STANDARD	DATE
BEN	2,900	ES	05/14/03
NAP	59	ES	05/14/03
BEN	2,110	ES	06/08/04
NAP	48.5J	ES	06/08/04

MW-3			
CONTAM	DETECT	STANDARD	DATE
BEN	110	ES	05/14/03
NAP	42	ES	05/14/03
BEN	51	ES	06/08/04

TW-3			
CONTAM	DETECT	STANDARD	DATE
BEN	10.1	ES	04/05/12
BODF	0.214	ES	04/05/12

W. MITCHELL STREET

BLDG. R

BLDG. Q

BLDG. P

BLDG. N

BLDG. S

SOUTH 66TH STREET

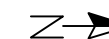
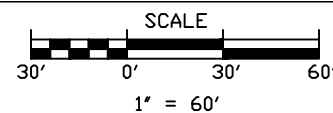
W. NATIONAL AVE

ELECTRIC  
6" GAS MAIN  
GAS & WATER

ELECTRIC  
6" GAS MAIN

LEGEND

PROPERTY LINES



THE ENVIRONMENTAL MANAGEMENT COMPANY LLC	
DATE: 04/29/12	DRAWN BY: TJM
LOCATION: 6633-39 W. NATIONAL AVE WEST ALLIS, WISCONSIN	

FIGURE 5  
DIRECTION OF  
GROUNDWATER FLOW

↑  
DIRECTION OF  
GROUNDWATER FLOW

93.16 MAY 15, 2003  
93.72 JUNE 8, 2004

W. MITCHELL STREET

SOUTH 66TH STREET

W. NATIONAL AVE

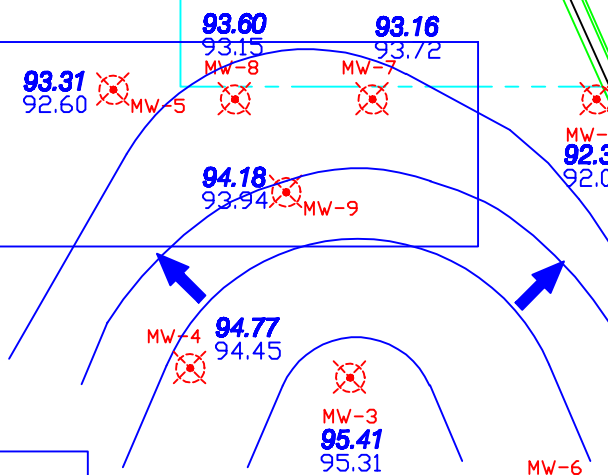
BLDG. S

BLDG. R

BLDG. Q

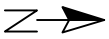
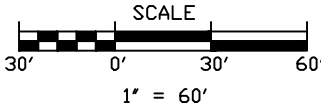
BLDG. P

BLDG. N



LEGEND

- PROPERTY LINES
- EXCAVATION SOIL SAMPLES



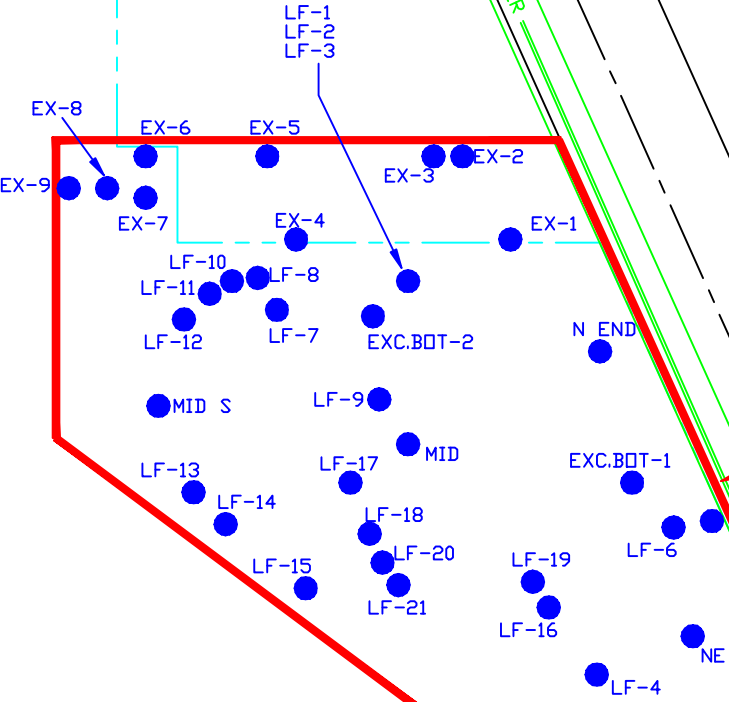
THE ENVIRONMENTAL MANAGEMENT COMPANY LLC			
DATE:	04/29/12	DRAWN BY:	TJM
LOCATION:	6633-39 W. NATIONAL AVE WEST ALLIS, WISCONSIN		

FIGURE 6  
EXCAVATION SOIL  
SAMPLE LOCATIONS

W. MITCHELL STREET

SOUTH 66TH STREET

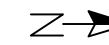
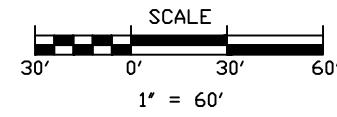
COMPLETED SOIL EXCAVATION/  
SOIL REMOVED TO  
OFF-SITE BIOTREATMENT



# LEGEND

----- PROPERTY LINES

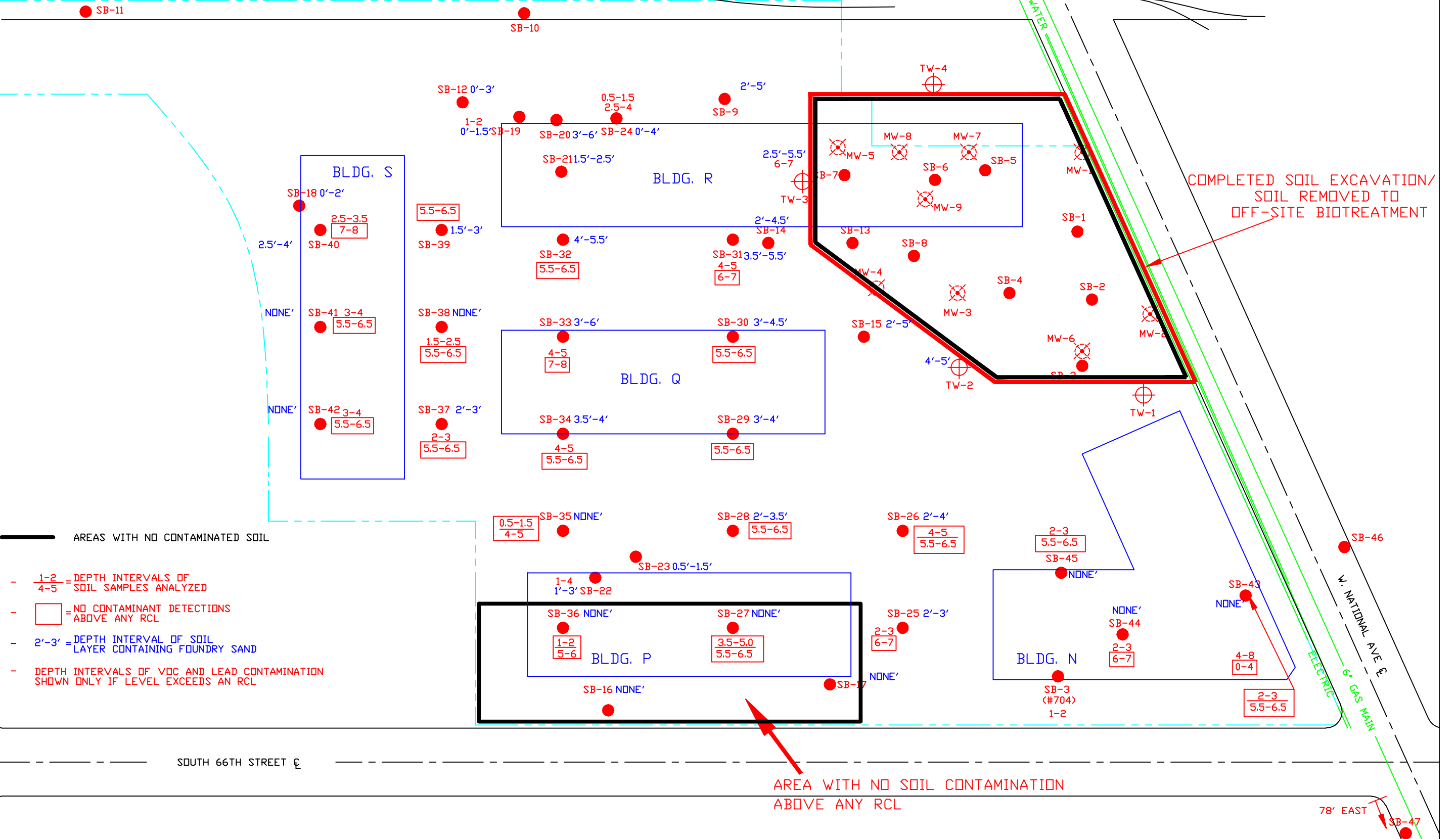
SPUR TRACK



THE ENVIRONMENTAL MANAGEMENT COMPANY LLC	
DATE: 04/29/12	DRAWN BY: TJM
LOCATION: 6633-39 W. NATIONAL AVE WEST ALLIS, WISCONSIN	

**FIGURE 7**  
AREAS AND DEPTH  
INTERVALS OF SOIL  
CONTAMINATION ABOVE RCL'S

COMPLETED SOIL EXCAVATION/  
SOIL REMOVED TO  
OFF-SITE BIOTREATMENT



FARMER'S MARKET

S. 66th ST.

W. LAPHAM ST.

S. 66th ST.

BUILDING O  
FF = 133.5 / 132.0

BUILDING N  
FF = 146.5  
LL = 137.1

BUILDING P  
FF = 138.0  
LL = 128.6

PARCEL 1  
C.S.M. NO. 6513

BUILDING Q  
FF = 140.0  
LL = 130.6

BUILDING S  
FF = 138.0  
LL = 128.6

PARCEL 2  
C.S.M. NO. 6513

BUILDING R  
FF = 140.0  
LL = 130.6

W. MITCHELL ST. (66')

WEST NATIONAL AVENUE

ASPHALT

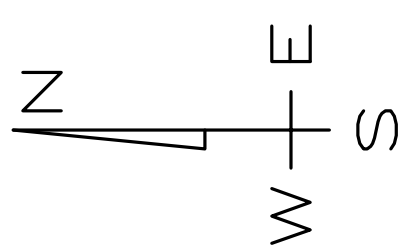
ASPHALT

ASPHALT

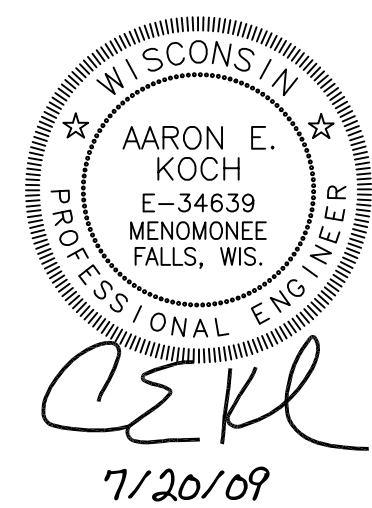
REMOVE AND  
REFURGE  
CONC APRON

NOTES:  
1. PIPE RUN LENGTHS AS SHOWN ON THIS PLAN ARE MEASURED NODE-TO-NODE (I.E. CENTER-TO-CENTER OF MANHOLES).  
2. SEE SHEET 7 OF THIS SET FOR DETAILS.  
3. THE LOCATION AND SIZE OF UNDERGROUND STRUCTURES AND UTILITIES SHOWN HEREON HAVE BEEN LOCATED TO A REASONABLE DEGREE OF ACCURACY, BUT THE ENGINEER DOES NOT GUARANTEE THEIR EXACT LOCATION OR THE LOCATION OF OTHERS NOT SHOWN.  
4. ALL SITE GRADING ACTIVITY AND EROSION CONTROL MEASURES SHALL COMPLY WITH THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES CONSTRUCTION SITE EROSION AND SEDIMENT CONTROL TECHNICAL STANDARDS (1000-1070). ALL EROSION CONTROL MEASURES MUST BE IN PLACE BEFORE CONSTRUCTION BEGINS AND SHALL BE MAINTAINED DURING CONSTRUCTION.

ABBREVIATIONS  
STP - STORM SEWER PIPE  
SSM - SANITARY SEWER MANHOLE  
SSP - SANITARY SEWER PIPE  
HYD - HYDRANT  
GV - GATE VALVE  
WM - WATERMAIN  
AV - AIR RELIEF VALVE AND BOX  
WMP - WATERMAIN PIPE



**DIGGERS HOTLINE**  
WISCONSIN STATE STATUTE 182.0175 REQUIRES  
THREE WORK DAYS NOTICE BEFORE YOU EXCAVATE  
CALL DIGGERS HOTLINE 1-800-242-8511



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DESIGNED BY: AEK  
CHECKED BY: ---  
APPROVED BY: \_\_\_\_\_  
TOWN/CITY ENGINEER DATE  
PROJECT NO.: 080367 - REV. DATE: Jul 20, 2009  
HOR. SCALE: 1"= 30'

**SITE PLAN**  
SIX POINTS FARMERS MARKET NEIGHBORHOOD  
PHASE II

CITY OF WEST ALLIS, MILWAUKEE COUNTY, WISCONSIN

SHEET 1 OF 7

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PROJECT NO. 080367, 01-SP-01.DWG - SIX POINTS FARMERS MARKET NEIGHBORHOOD, SHEET 1 OF 7, CITY OF WEST ALLIS, MILWAUKEE COUNTY, WISCONSIN

# TABLES

# APPENDIX A

## UST CLOSURE DOCUMENTATION

## APPENDIX B

### SOIL DISPOSAL DOCUMENTATION

## APPENDIX C

### LABORATORY ANALYTICAL RESULTS

## APPENDIX D

### SOIL BORING LOGS